

## Smart home automation in the age of Internet of Things

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### ABSTRACT

*Internet of Things (IoT) is an emerging technology that is making our world smarter. The idea of a connected world cannot be imagined without IoT. An IoT based Smart Home is one such example. In IoT Smart Home environment enable various things such as lighting, home appliances, computers, security etc. All devices are connected to the Internet and allowing the user to monitor and control things regardless of time and location constraint the proposed system presented in this paper is used for monitoring and controlling the Smart Home environment.*

**Keywords**— IoT, Thermostat, Monitor, HVAC



### 1. INTRODUCTION

If you have been following the tech news even a little bit over the last few years, you've heard of the Internet of Things. The IoT, we're told, is supposed to revolutionize the way we interact with technology and will change the way we live our lives. The Internet of Things (IoT) is said to be the next new revolution after mobile devices. IoT is simply a technology that allows the interconnection of billions of devices to each other. This will help both individuals and companies revolutionize their data and make life better

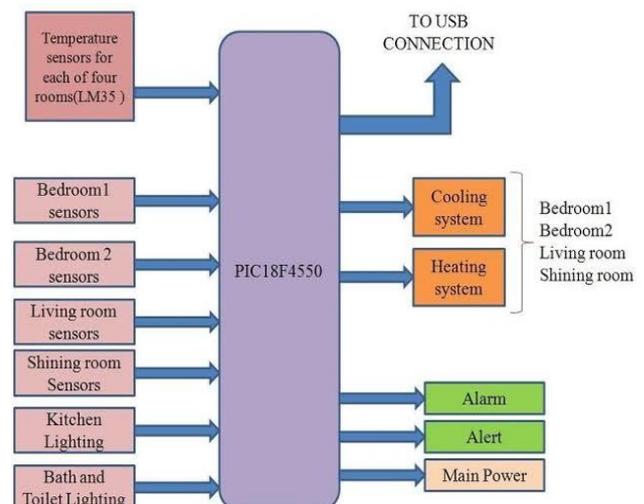
### 2. HOME SMART HOME

Home for a belonging is the best place than ever, it provides a restful shelter to us. It is a dream to make it fully controlled from a place away from home. Internet of Things has come this dream true, as it allows the person to operate his house remotely from any place where the person is just with an internet connection. IOT Homes are the coming time for us when all our home appliances will work automatically, we can monitor our things and home environment with our smartphones. IOT gave our home a power of deciding everything according to our comforts whether we are present or not. Various controlling devices like a fit bit, remote-controlled lighting, etc. Working now a day's describe the initial phase of the smart livings. IOT scenario will give home with controllability at distant operable devices using the data packet connection with the world.

#### 2.1 Features of Smart Homes using IoT

Smart Homes or sensible livings with the Internet of Things are self-configuring, decision-maker, relevant in work, durable for security. Smart homes consist of following features:

**2.1.1 Temperature control in smart homes:** When a person first decides to dip his toe into home automation, for his first smart purchase, he is likely to choose a thermostat. Smart thermostats allow users to remotely control their home's temperature.



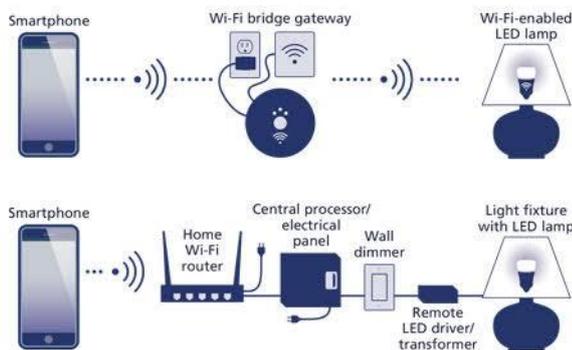
Further, most models can gather data and learn, when users are home and what temperature to set during different periods of the day. Smart thermostats are cheap, but they have a large impact on the home. They allow users to adjust heating setting from other internet connected devices, such as smartphones. This allows users to easily adjust the temperature remotely. The smart thermostat also records internal/external temperature the HVAC system has been running and can even notify you if your air filter needs to be replaced.

**2.1.2 Security in smart homes:** Smart security systems can be used for unlocking the doors of the homes as the user is about to come and reach a certain distance. The system will get the response to unlocking the door through the user smartphone when the user is within the threshold distance range.



It does not need the intervention of the user to operate function using the key for opening the door. Smart security also allows the homeowner to unlock the door remotely for the guests in his absence.

**2.1.3 Smart lighting in smart homes:** In Smart Homes, the user can control lights of the house with the help of a smartphone which includes the inbuilt program to turn on/off at needed precautions. It will also monitor electricity use. The user can screw the damage if occur from any place and control the intensity from a phone with dimmer function. Thus, the user operates the house remotely and the lighting works easily without wiring in the whole house.



**2.1.4 Outdoors monitoring in the smart homes:** Smart homes are not only limited for the interior of the house but also look after the outdoor. Smart plant sensors can be used to keep the monitoring of plant's water and sunlight. It will send an alert when it will need the water and if the water necessity in soil is enough to turn off. A smart sprinkler system can be controlled remotely and allow the user to turn it on/off in the condition like heat or rain.

**2.1.5 Alarming system in the smart home:** In smart homes, various detectors are being used to alarm the user regarding the home's condition. The smoke detectors are there for the fire smoke prediction, carbon monoxide prediction or any other. The motion sensors are there for anti-theft purposes. These detectors will earshot off the beeps of alarm in the user's phone and also gave alert to the security officer regarding it. The smart home gave the alarm with a beep if there is any detection over the user's mobile phone.

The Smart Homes using the Internet of Things is a technology in which interconnection is there between varied interconnected devices and the Internet and provide various examples as:

**2.1.6 Communication between the devices at home:** Internet of Things encourages communication between the devices, known to be Machine-to-Machine (M2M) communication. Because of this, the physical sensors/devices are able to stay connected with the main hub as well as with each other and hence there is the transparency between them. As our temperature controlling sensor connected to the internet will give the variation value of temperature or humidity to the user and the fan and ventilation controllers so that they will operate according to the requirement.

**2.1.7 Automation controls at homes:** In IoT physical objects are connected to the universal network called the Internet and controlled digitally with central wireless hub known as the controller. This main hub works and controls automation without human intervention, thus machines are able to communicate with each other lead to faster and in time outputs in the absence of a human. As the fire alarm gave alert to the user when there occur fire at home and the automation controller self-gave the command to sprinklers.



**2.1.8 Homes to monitor automatically and provide regarding information to the user:** There is the advantage of the Internet of Things based Homes in functioning regarding the care. There are sensors in these houses which monitor the environmental conditions, regularly keep track of the household regarding supplies and their quantity in the storage. This will help the user with remotely providing the vision regarding ingredients in refrigerators using the camera and user get things from a grocery store in an easy manner. The air condition at home also gave information regarding the smoke or carbon monoxide in the air so that exhausts will work regarding the condition. It is obvious that having information regarding the situation at home help the user in making better decisions. Furthermore, monitoring the expiration of products also improves safety for the user.

**2.1.9 Homes to provide efficiency in results and save user's time and money:** In IoT homes, there is the interaction between belonging and home also machine-to-machine conversation is being there. This provides better efficiency for getting accurate results regarding the variations and controlling at home and using new IoT protocols these can be obtained fast so a user takes a decision in a sensible time. This results in saving our valuable time. IoT Homes save our money. As if IoT once implemented it saves money by tagging the equipment, taking care of its condition, monitoring their daily routines and providing the alert to people in their appliances efficient manner working.

It could be better convenience of life in homes



IoT Homes provide all the applications in which there will be stress relief to human regarding home's work. This technology gave a being a life with increased comforts, convenience in tasking and optimum management system tools for controlling, thereby improving the user's life.

### 3. CONCLUSION

Home Automation System make our home a smart, sensible home with all kinds of comforts and alerts present in them. Internet of Things based these systems will be operated all over the globe using internet connectivity. With the help of this user will analyze all conditions and situations at home. IOT based home system is the future of our homes. This research paper presents the design and provides an implemented model with the systems that could be used in future homes.

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